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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: **Schmidl et al.**
Serial No.: **09/777,203**
Filed: **February 5, 2001**

Docket: **TI-31284**
Examiner: **Q. Ghulamali**
Art Unit: **2611**
Conf. No.: **3036**

For: **WIRELESS COMMUNICATIONS WITH EFFICIENT CHANNEL CODING**

APPELLANTS' BRIEF

June 2, 2011

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATION OF FACSIMILE TRANSMITTAL

I hereby certify that the above correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office on June 2, 2011.

Robert N. Rountree

Dear Sir:

In support of their appeal of the Final Rejection of claims in the above-referenced application, Appellants respectfully submit herein their brief.

1. REAL PARTY IN INTEREST

Texas Instruments Incorporated is the real party in interest.

2. RELATED APPEALS AND INTERFERENCES

No other related appeals or interferences are known to Appellants.

3. STATUS OF CLAIMS

Claims 10-22 and 33-51 are pending. Claims 42-51 are rejected under 35 U.S.C. §102(e). Claims 10-22, 33-39, and 40-41 are rejected under 35 U.S.C. §103(a). Claims 1-9 and 23-32 are cancelled without prejudice.

Examiner in an Office Action of January 18, 2011 made final rejection of claims 10-22 and 33-51. Claims 10-22 and 33-51 are on appeal and are reproduced in the Appendix to Appellants' Brief filed herewith.

4. STATUS OF AMENDMENTS

No amendment was filed subsequent to final rejection.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 10 is directed to a data communication apparatus as illustrated at Figure 12B and described at page 14, lines 4-20 of the instant specification. The apparatus includes a controller 195 of Figure 19A described at page 16, line 21 through page 17, line 6. The controller establishes communication in a first mode (mode 1) with another data communication apparatus and switches to communication in a second mode (mode 3) with said another data communication apparatus after communication is established. The apparatus further includes an input (UNCODED DATA) for receiving original data bits that are to be transmitted via a communication channel to a remote data communication apparatus. An encoder (1210) is coupled to the input for applying an encoding algorithm to the original data bits that produces parity bits. An output is provided (from 1214) for bits that are to be transmitted across the communication channel. A data path is coupled between the encoder and the output. The data path receives information from the remote data communication apparatus (ACK/NAK, page 14, lines 11-20). The data path selects one of the original data bits with Cyclical Redundancy Check (CRC) bits and the parity bits in response to first information (ACK, page 14, lines 10-11). The

data path selects the other of the original data bits with CRC bits and the parity bits in response to second information (NAK, page 14, lines 11-20). The selected information is provided to the output for transmission across the communication channel to the remote data communication apparatus.

Independent claim 16 is directed to a data communication apparatus as illustrated at Figure 12A and described at page 12, line 19 through page 14, line 3 of the instant specification. The apparatus includes a controller 195 of Figure 19A described at page 16, line 21 through page 17, line 6. The controller establishes communication in a first mode (mode 1) with another data communication apparatus and switches to communication in a second mode (mode 3) with said another data communication apparatus after communication is established. The data communication apparatus further includes an input (INCOMMING DATA PACKET) for receiving a received version of original bits with Cyclical Redundancy Check (CRC) bits in response to first information without parity bits produced at a remote data communication apparatus by operation of an encoding algorithm applied to the original bits. (page 14, lines 10-11). The input receives parity bits in response to second information (NAK, page 14, lines 11-20).The original bits with CRC bits and parity bits are transmitted over a communication channel by the remote data communication apparatus. An error detector (1205) is coupled to the input for determining whether the received version of the original data bits is correct in response to the CRC bits. (page 13, lines 1-3). A controller (1206) is coupled to the error detector. In response to a determination that the received version of the original data bits is correct (ACK) it provides first information to the remote data communication apparatus. (page 13, lines 3-5). In response to a determination that the received version of the original data bits is incorrect (NAK) it provides second information to the remote data communication apparatus.

Independent claim 33 is directed to a method of communicating data from a transmitting end (Figure 12B) to a receiving end (Figure 12A) as illustrated by the flow chart of Figure 12 and described at page 11, line 14 through page 12, line 18 of the instant specification. The method includes the steps of establishing communication in a first mode (mode 1) with the receiving end and switching to a second mode (mode 2) of communication with the receiving end after

communication is established (Figure 5 and page 9, line 20 through page 10, line 2). The transmitting end applies to a plurality of original data bits that are to be transmitted to the receiving end an encoding algorithm (120) that produces Cyclical Redundancy Check (CRC) bits and parity bits. (page 11, lines 14-17). The transmitting end transmits the original data bits and the CRC bits without the parity bits in a first transmission to the receiving end. (page 11, lines 17-20). The transmitting end refrains from transmitting the parity bits until the transmitting end receives an indication from the receiving end that the original data bits have not been correctly received at the receiving end. (page 11, lines 18-21).

Independent claim 40 is directed to a method of communicating data from a transmitting end (Figure 12B) to a receiving end (Figure 12A) as illustrated by the flow chart of Figure 12 and described at page 11, line 14 through page 12, line 18 if the instant specification. The method includes the steps of establishing communication in a first mode (mode 1) with the receiving end and switching to a second mode (mode 2) of communication with the receiving end after communication is established (Figure 5 and page 9, line 20 through page 10, line 2). The receiving end receives from the transmitting end a first transmission including original data bits and Cyclical Redundancy Check (CRC) bits without parity bits produced at the transmitting end by operation of an encoding algorithm applied to the original data bits. (page 14, lines 10-11). The receiving end determines whether the original data bits have been received correctly in response to the CRC bits. (Figure 12, CRC CORRECT?). In response to a determination that the original data bits have not been received correctly, the receiving end transmits to the transmitting (122) end a request for transmission of the parity bits. (page 11, lines 18-20).

Independent claim 42 is directed to a method of transmitting data as illustrated by the flow chart of Figure 12 and described at page 11, line 14 through page 12, line 18 of the instant specification. The method includes encoding data by a first method (GFSK) to establish communication with a remote receiver and encoding data by a second method (16 or 64 QAM) to communicate with the remote receiver after communication is established as described at Figure 3 and page 9, lines 8 through 19. The method further includes applying an encoding algorithm (120) that produces parity bits to a plurality of original data bits that are to be transmitted. (page

11, lines 14-17). The original data bits with Cyclical Redundancy Check (CRC) bits and without the parity bits are transmitted in a first transmission. (page 14, lines 10-11). The parity bits are not transmitted until there is an indication that the original data bits have not been correctly received. (page 11, lines 18-20).

Independent claim 46 is directed to a method of receiving data as illustrated by the flow chart of Figure 12 and described at page 11, line 14 through page 12, line 18 of the instant specification. The method includes encoding data by a first method (GFSK) to establish communication with a remote receiver and encoding data by a second method (16 or 64 QAM) to communicate with the remote receiver after communication is established as described at Figure 3 and page 9, lines 8 through 19. The method further includes receiving a first transmission including original data bits and Cyclical Redundancy Check (CRC) bits without parity bits produced by operation of an encoding algorithm applied to the original data bits. (page 14, lines 10-11). The method further includes determining that the original data bits have not been received correctly in response to the CRC bits (122). A request for transmission of parity bits is transmitted in response to the determination that the data bits have not been received correctly. (page 11, lines 18-20).

6. GROUNDS FOR REJECTION TO BE REVIEWED ON APPEAL

A. Claims 42-51 are rejected under 35 U.S.C. § 102(e) as being anticipated by Mantha et al. (U.S. Pat. No. 7,000,174).

B. Claims 10-22, 33-39, and 40-41 are rejected under 35 U.S.C. § 103(a) as being unpatentable over by Mantha et al. (U.S. Pat. No. 7,000,174) in view of Hawkins et al. (U.S. Pub. No. 2006/0205432).

7. ARGUMENT

A. Claims 42-51 are rejected under 35 U.S.C. § 102(e) as being anticipated by Mantha et al. (U.S. Pat. No. 7,000,174).

Independent claim 42 recites "A method of transmitting data, comprising: **encoding data by a first method to establish communication with a remote receiver; encoding data by a second method to communicate with the remote receiver after communication is established;** applying an encoding algorithm that produces parity bits to a plurality of original data bits that are to be transmitted; transmitting the original data bits with Cyclical Redundancy Check (CRC) bits to the remote receiver without the parity bits in a first transmission; and refraining from transmitting the parity bits until receiving an indication that the original data bits have not been correctly received." (emphasis added).

Independent claim 46 recites "A method of receiving data, comprising: **encoding data by a first method to establish communication with a remote transmitter; encoding data by a second method to communicate with the remote transmitter after communication is established;** receiving a first transmission from the remote transmitter including original data bits and Cyclical Redundancy Check (CRC) bits without parity bits produced by operation of an encoding algorithm applied to the original data bits; determining that the original data bits have not been received correctly in response to the CRC bits; and transmitting a request for transmission of parity bits to the remote transmitter responsive to the step of determining." (emphasis added).

The foregoing emphasized limitations of the present invention are described in detail at page 9, lines 8 through 19 (Figure 3) and page 10, lines 3-14 (Figure 6A). Examiner cites col. 2, lines 29-40 (type-I) and col. 2, lines 42-57 (type-II) of Mantha et al. as the first and second encoding methods of claims 42 and 46. The Type I and Type-II methods of Mantha et al. are independent methods. There is no teaching or suggestion that they might be used together as required by claims 42 and 46. Moreover, claims 42 and 46 require encoding data by a first

method to establish communication and encoding data by a second method after communication is established. These features of the present invention are not disclosed by the cited reference. Thus, Appellants respectfully submit that independent claims 42 and 46 and their respective depending claims are patentable under 35 U.S.C. §102(e) over Mantha et al.

B. Claims 10-22, 33-39, and 40-41 are rejected under 35 U.S.C. § 103(a) as being unpatentable over by Mantha et al. (U.S. Pat. No. 7,000,174) in view of Hawkins et al. (U.S. Pub. No. 2006/0205432).

Regarding independent claim 40, Examiner admits Mantha et al. fail to disclose "establishing communication in a first mode with the transmitting end; switching to a second mode of communication with the transmitting end after communication is established" (Office Action of 1/18/2011, page 3). Regarding independent claims 10 and 16, Examiner admits Mantha et al. fail to disclose "a controller arranged to establish communication in a first mode with another data communication apparatus, the controller arranged to switch to communication in a second mode with said another data communication apparatus after communication is established" (Office Action of 1/18/2011, pages 4 and 7). Regarding independent claim 33, Examiner admits Mantha et al. fail to disclose "establishing communication in a first mode with the receiving end; switching to a second mode of communication with the receiving end after communication is established" (Office Action of 1/18/2011, page 9). Examiner relies on the disclosure of Hawkins et al. at "page 6, section 0072, lines 3-12; section 0083, lines 3-11; section 0084, lines 1-3" for the foregoing limitations. (Appellants believe Examiner intended to cite section 0082 rather than section 0072.) These sections of Hawkins et al. generally describe a switch configuration of Figure 5B, which Appellants respectfully submit was first added as a continuation-in-part filed February 14, 2006. The instant application claims priority to numerous provisional applications having priority dates from June 9, 2000, through August 29, 2000. Appellants respectfully submit, therefore, that the cited disclosure of Hawkins et al. is not prior art to the instant application.

Moreover, the cited reference of Hawkins et al. includes a priority claim to U.S. Patent Application No. 09/374,095, filed August 12, 1999, now U.S. Patent No. 6,516,202. The '202 patent is the only reference having an earlier priority date than the instant application. However, the '202 patent has a different Figure 5B and does not include any of the sections cited by Examiner from Hawkins et al. Claims 40-41, 10-22, and 33-39 cannot be rejected as unpatentable over Mantha et al. alone according to Examiner's own admission. Thus, Appellants respectfully submit that claims 40-41, 10-22, and 33-39 are patentable under 35 U.S.C. §103(a).

In view of the foregoing, Appellants respectfully request favorable consideration of the appeal from Final Rejection in the above referenced application, its reversal, and allowance of claims 10-21 and 33-51.

8. APPENDIX

CLAIMS ON APPEAL

Claims 1-9 (Cancelled)

10. (Previously amended) A data communication apparatus, comprising:

a controller arranged to establish communication in a first mode with another data communication apparatus, the controller arranged to switch to communication in a second mode with said another data communication apparatus after communication is established;

an input for receiving original data bits that are to be transmitted via a communication channel to said another data communication apparatus;

an encoder coupled to said input for applying to the original data bits an encoding algorithm that produces parity bits;

an output for providing bits that are to be transmitted across the communication channel; and

a data path coupled between said encoder and said output, said data path receiving information from said another data communication apparatus, said data path selecting one of the original data bits with Cyclical Redundancy Check (CRC) bits and the parity bits in response to a first information, said data path selecting the other of the original data bits with CRC bits and the parity bits in response to a second information, to be provided to said output for transmission across the communication channel to said another data communication apparatus.

11. (Previously amended) The apparatus of Claim 10, wherein said data path includes a buffer coupled to said encoder for storing the original data bits and the parity bits.

12. (Previously amended) The apparatus of Claim 11, wherein said data path includes a selector coupled between said buffer and said output, said selector responsive to said information for obtaining one of the original data bits with CRC bits and the parity bits from said buffer to be provided to said output for transmission to said another data communication apparatus.

13. (Previously amended) The apparatus of Claim 10, wherein said first information includes an acknowledgement and said second information includes a negative acknowledgement indicating that an earlier transmission has not been received correctly at said another communication apparatus, said data path responsive to the negative acknowledgement for changing its selection from one of the original data bits with CRC bits and the parity bits to the other of the original data bits with CRC bits and the parity bits.

14. (Original) The apparatus of Claim 10, provided as a wireless communication apparatus.

15. (Original) The apparatus of Claim 10, wherein said encoder is a convolutional encoder.

16. (Previously amended) A data communication apparatus, comprising:

a controller arranged to establish communication in a first mode with another data communication apparatus, the controller arranged to switch to communication in a second mode with said another data communication apparatus after communication is established;

an input for receiving a received version of original bits with Cyclical Redundancy Check (CRC) bits in response to a first information without parity bits produced at said another data communication apparatus by operation of an encoding algorithm applied to the original bits, said input receiving said parity bits in response to a second information, said original bits with CRC bits and parity bits transmitted over a communication channel by said another data communication apparatus;

an error detector coupled to said input for determining whether the received version of the original data bits is correct in response to the CRC bits; and

a controller coupled to said error detector, responsive to a determination that the received version of the original data bits is correct for providing said first information to said another data communication apparatus, and responsive to a determination that the received version of the original data bits is incorrect for providing said second information to said another data communication apparatus.

17. (Previously amended) The apparatus of Claim 16, wherein said input is further for receiving a received version of the parity bits as transmitted from said another data communication apparatus, said controller coupled to said input for applying to the received version of the parity bits a mapping operation which, if the parity bits have been received correctly at the receiving end, will result in the original data bits, said error detector coupled to said controller for applying an error detection procedure to the result of the mapping operation to determine whether the mapping operation has resulted in the original data bits.

18. (Previously amended) The apparatus of Claim 17, including a decoder coupled to said input and said controller, said controller responsive to a determination by said error detector that the mapping operation has not resulted in the original data bits for signaling said decoder to apply to the received version of the original data bits and the received version of the parity bits a decoding algorithm that corresponds to said encoding algorithm.

19. (Previously amended) The apparatus of Claim 18, including a buffer coupled between said input and said decoder for storing the received version of the original bits and the received version of the parity bits for use by said decoder.

20. (Previously amended) The apparatus of Claim 18, wherein said error detector is coupled to said decoder for determining whether said decoding algorithm has resulted in the original data bits, said controller operable in response to a determination that said decoding algorithm has not resulted in the original data bits for providing for transmission to said another data communication apparatus a request for retransmission of the original data bits with CRC bits.

21. (Original) The apparatus of Claim 18, wherein said decoder is a Viterbi decoder.

22. (Original) The apparatus of Claim 16, provided as a wireless communication apparatus.

Claims 23-32 (Cancelled)

33. (Previously amended) A method of communicating data from a transmitting end to a receiving end, comprising:

establishing communication in a first mode with the receiving end;

switching to a second mode of communication with the receiving end after communication is established;

the transmitting end applying to a plurality of original data bits that are to be transmitted to the receiving end an encoding algorithm that produces Cyclical Redundancy Check (CRC) bits and parity bits;

the transmitting end transmitting the original data bits and the CRC bits without the parity bits in a first transmission to the receiving end; and

the transmitting end refraining from transmitting the parity bits until the transmitting end receives an indication from the receiving end that the original data bits have not been correctly received at the receiving end.

34. (Previously added) The method of Claim 33, including the transmitting end transmitting the parity bits to the receiving end in a second transmission in response to an indication from the receiving end that the original data bits have not been correctly received at the receiving end.

35. (Previously added) The method of Claim 34, including the receiving end combining a received version of the original data bits and a received version of the parity bits to produce a combined set of received bits, and the receiving end applying to the combined set of received bits a decoding algorithm that corresponds to said encoding algorithm.

36. (Previously added) The method of Claim 34, including the receiving end applying to a received version of the parity bits a mapping operation which, if the parity bits have been received correctly at the receiving end, will result in the original data bits, and the receiving end applying an error detection procedure to the result of the mapping operation to determine whether the mapping operation has resulted in the original data bits and, in response to a determination that the mapping operation has not resulted in the original data bits, the receiving end combining the received version of the parity bits with a received version of the original data bits to produce

a combined set of received bits, and the receiving end applying to the combined set of received bits a decoding algorithm that corresponds to said encoding algorithm.

37. (Previously added) The method of Claim 36, wherein said encoding and decoding algorithms are Viterbi encoding and decoding algorithms.

38. (Previously added) The method of Claim 36, including the receiving end applying an error detection procedure to a result of said decoding algorithm with the CRC bits to determine whether said decoding algorithm has resulted in the original data bits and, in response to a determination that said decoding algorithm has not resulted in the original data bits, the receiving end transmitting to the transmitting end a request for retransmission of the original data bits.

39. (Previously added) The method of Claim 38, including the transmitting end retransmitting the original data bits to the receiving end and, in response to a determination by the receiving end that said retransmission of the original data bits has not been received correctly, the receiving end combining a received version of the retransmitted original data bits with said received version of the parity bits to produce another combined set of received bits, and the receiving end applying said decoding algorithm to said another combined set of received bits.

40. (Previously amended) A method of communicating data from a transmitting end to a receiving end, comprising:

establishing communication in a first mode with the transmitting end;

switching to a second mode of communication with the transmitting end after communication is established;

the receiving end receiving from the transmitting end a first transmission including original data bits and Cyclical Redundancy Check (CRC) bits without parity bits produced at the transmitting end by operation of an encoding algorithm applied to the original data bits;

the receiving end determining whether the original data bits have been received correctly in response to the CRC bits and, responsive to a determination that the original data bits have not

been received correctly, the receiving end transmitting to the transmitting end a request for transmission of the parity bits.

41. (Previously added) The method of Claim 40, wherein the encoding algorithm is a convolutional encoding algorithm.

42. (Previously amended) A method of transmitting data, comprising:

encoding data by a first method to establish communication with a remote receiver;

encoding data by a second method to communicate with the remote receiver after communication is established;

applying an encoding algorithm that produces parity bits to a plurality of original data bits that are to be transmitted;

transmitting the original data bits with Cyclical Redundancy Check (CRC) bits to the remote receiver without the parity bits in a first transmission; and

refraining from transmitting the parity bits until receiving an indication that the original data bits have not been correctly received.

43. (Previously added) The method of Claim 42, comprising transmitting the parity bits in a second transmission in response to the indication that the original data bits have not been correctly received.

44. (Previously added) The method of Claim 42, wherein said encoding algorithm is a Viterbi encoding algorithm.

45. (Previously added) The method of Claim 42, comprising retransmitting the original data bits.

46. (Previously amended) A method of receiving data, comprising:

encoding data by a first method to establish communication with a remote transmitter;

encoding data by a second method to communicate with the remote transmitter after communication is established;

receiving a first transmission from the remote transmitter including original data bits and Cyclical Redundancy Check (CRC) bits without parity bits produced by operation of an encoding algorithm applied to the original data bits;

determining that the original data bits have not been received correctly in response to the CRC bits; and

transmitting a request for transmission of parity bits to the remote transmitter responsive to the step of determining.

47. (Previously added) The method of Claim 46, wherein the encoding algorithm is a convolutional encoding algorithm.

48. (Previously added) The method of Claim 46, comprising:

combining a received version of the original data bits and a received version of the parity bits to produce a combined set of received bits; and

applying a decoding algorithm that corresponds to said encoding algorithm to the combined set of received bits to produce decoded data bits.

49. (Previously added) The method of Claim 48, comprising:

applying a CRC error detection procedure to the decoded data bits;

determining the decoded data bits are not the same as the original data bits in response to the step of applying; and

transmitting a request for retransmission of the original data bits in response to the step of determining.

50. (Previously added) The method of Claim 48, comprising:

receiving a retransmission of the original data bits and a retransmission of the CRC bits;

determining that said retransmission of the original data bits has not been received correctly in response to the retransmission of the CRC bits;

combining a received version of the retransmitted original data bits with said received version of the parity bits to produce another combined set of received bits; and

applying said decoding algorithm to said another combined set of received bits.

51. (Previously added) The method of Claim 46, comprising:

applying a mapping operation to a received version of the parity bits to produce resultant data bits;

applying a CRC error detection procedure to the resultant data bits;

determining that the resultant data bits are not the same as the original data bits in response to the step of applying a CRC error detection procedure;

combining the received version of the parity bits with a received version of the original data bits to produce a combined set of received bits; and

applying a decoding algorithm that corresponds to said encoding algorithm to the combined set of received bits.

9. EVIDENCE APPENDIX

None.

10. RELATED PROCEEDINGS APPENDIX

None.

Respectfully submitted,

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